Caltrans

CALTRANS REGIONAL OPERATIONS FORUMS

Traffic Incident Management / Emergency Operations / Planned Special Events / Work Zones

Session Focus

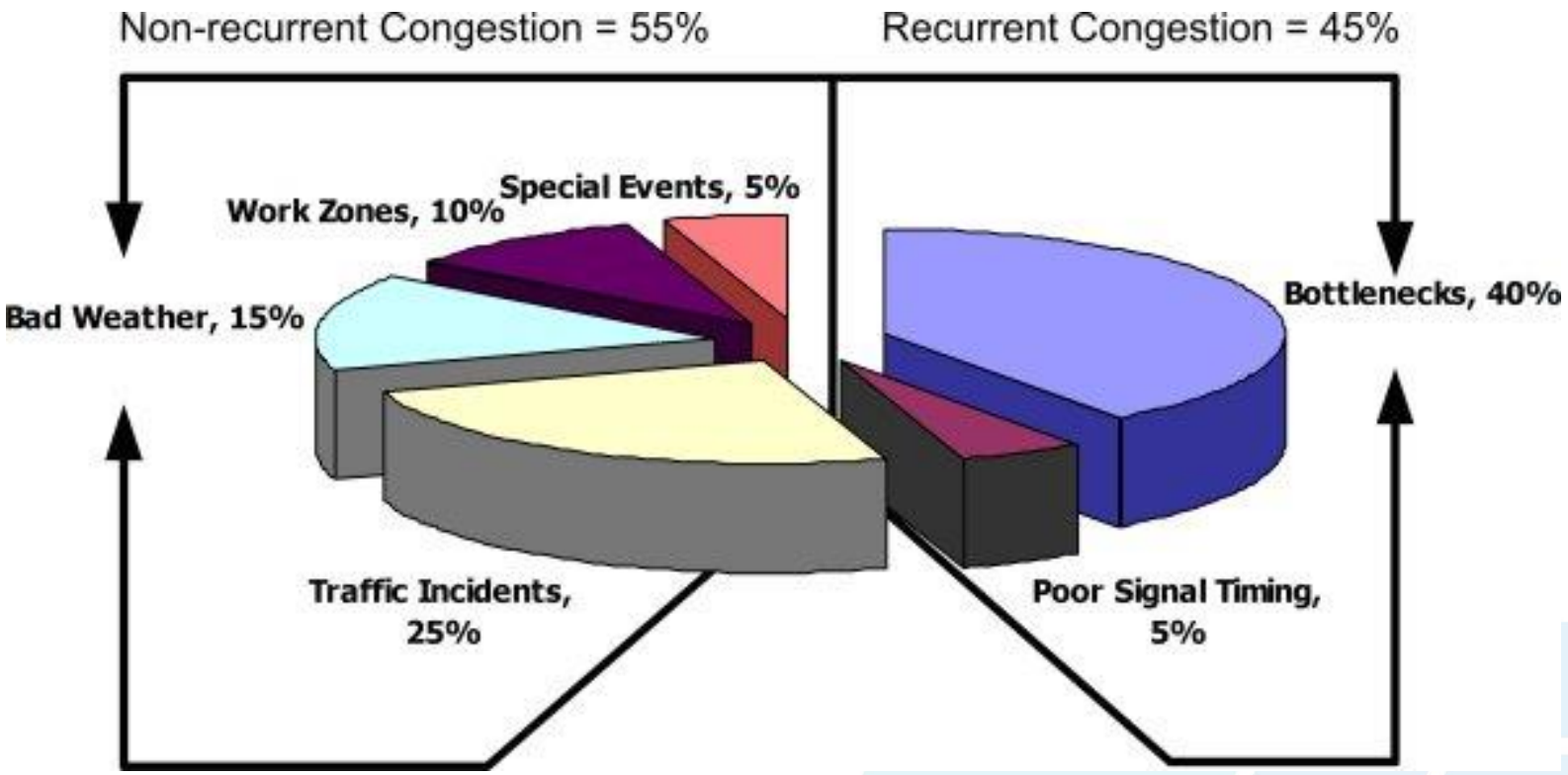
- Managing “events”
  - Conditions that are outside “normal” or ideal
  - Disruptions to the system
- Two basic categories of events – planned and unplanned

Planned	Unplanned
- Special events - Work zones (most)	- Traffic incidents - Emergency situations - Weather events

Effects of Events

- Events cause non-recurring congestion
- Create conditions that are:
  - Changing over time
  - Less predictable
  - Unexpected to system users
- Infrastructure investments help but are not full solutions

Effects of Events



Managing Non-Recurring Congestion and TSMO

Managing and preparing for these events is an operational philosophy that supports and becomes a foundation for transportation system management and operations (TSMO).

Traffic Incident Management

Traffic Incident Management (TIM)

- Planned, coordinated, multidisciplinary process
- Detect, respond to, and clear traffic incidents
- Restore traffic flow as safely and quickly as possible

- Reduce duration and impacts of traffic incidents
- Improve the safety of motorists, crash victims, and responders

National TIM Program Vision…

Enhanced planning and training of all TIM personnel:

1. Reduce or eliminate responder and motorist injuries and fatalities
2. Promote rapid incident clearance, thereby reducing traffic congestion and vulnerability
3. Develop or enhance local TIM Programs that ultimately benefit corridors, regions, and states
4. Measure performance that demonstrates improved TIM responses and programs over time
5. Emphasize TIM as a system operations “core mission” for all responders

The Evolving Business Case: Why TIM?

1. **Safety**
   - ↳ Victims
   - ↳ Responders
   - ↳ Travelers

The Evolving Business Case: Why TIM?

2. Cost

	Cost of Crashes		Cost of Congestion	
	Total	Average Per Person	Total	Average Per Person
2005 National	$164.2 billion	$1,051	$57 billion	$430
2009 National	$299.5 billion	$1,522	$97.7 billion	$590

Source: AAA Crashes vs. Congestion, What's the Cost to Society? - Nov. 2011

Why TIM?

In California, since 2010, 27 responders have been killed in the line-of-duty while responding to incidents on California's highways:

Law Enforcement - **9 Officers Killed**
Ken Collier, San Diego Sheriff – Feb 28, 2010
Phillip Ortiz, CHP – June 22, 2010
Justin McGrory, CHP – June 27, 2010
Brett Oswald, CHP – June 27, 2010
Ryan Bonaminio, Riverside PD – Nov 7, 2010
Brian Law, CHP – Feb 17, 2014
Juan Gonzalez, CHP – Feb 17, 2014
Kostiuchenko, Ventura Sheriff – Oct 28, 2014
Nathan Taylor – March 13, 2016

Fire Personnel - **2 Responders Killed**
David Ratledge – Feb 29, 2012
Christopher Douglas – Jul 5, 2013

EMS – **2 EMS Personnel Killed**
Esteban Bahena – April 1, 2010
Douglas Odgers – May 8, 2011

Towing - **10 Tow Operators Killed**
Michael Sanders – Feb 7, 2011
Christopher Tatro – Dec 17, 2011
David Robinson – Mar 20, 2012
Jesus Salcedo – Mar 30, 2012
Shaun Riddle – Dec 8, 2012
Faapuna Manu - Dec 8, 2012
Ronald Carver – Feb 11, 2013
Christopher Gladden – July 28, 2013
Ricardo Valdez – January 28, 2014
Jabar Issa – January 17, 2015

Caltrans Maintenance – **4 Workers Killed**
Gary Smith – Nov 7, 2010
Stephen Palmer – May 4, 2011
Jaime Obeso – June 7, 2011
Richard Gonzalez – June 20, 2011

Why TIM?

2016 District 10 Statistics

~42,000 activities

TMC Logs:

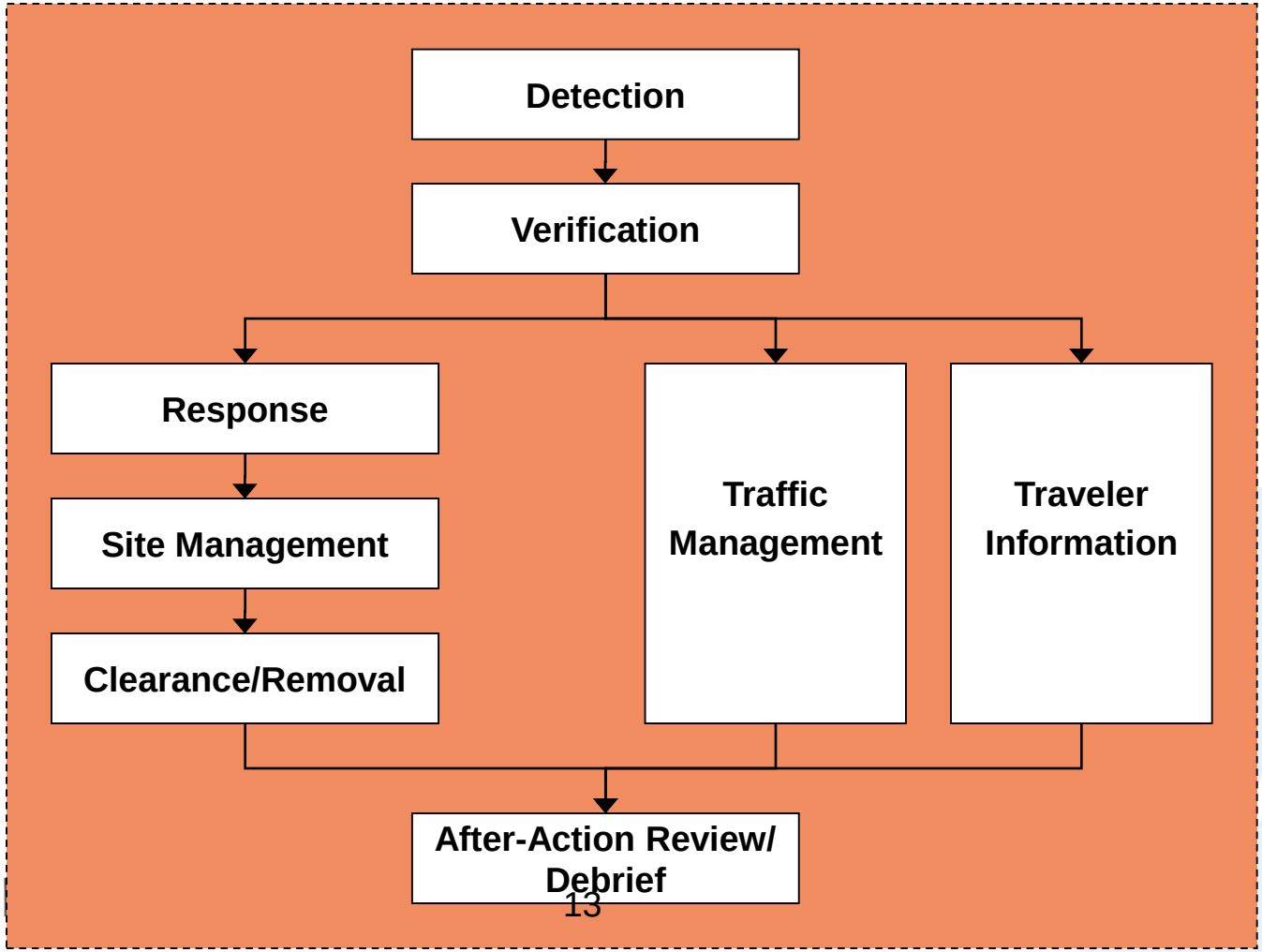
- 6515 Incidents reported
  - 1 fatality every 6 days

MIDB

- 282 “Major” incidents reported
  - 1040 hours (43 days) of lane blocking incidents

…12% of the time there was a lane blocking incident

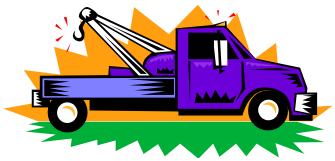
TIM Process


Detection
Verification
Response
Site Management
Clearance/Removal
Traffic Management
Traveler Information
After-Action Review/ Debrief

National Unified Goal for TIM

The NUG for TIM is:

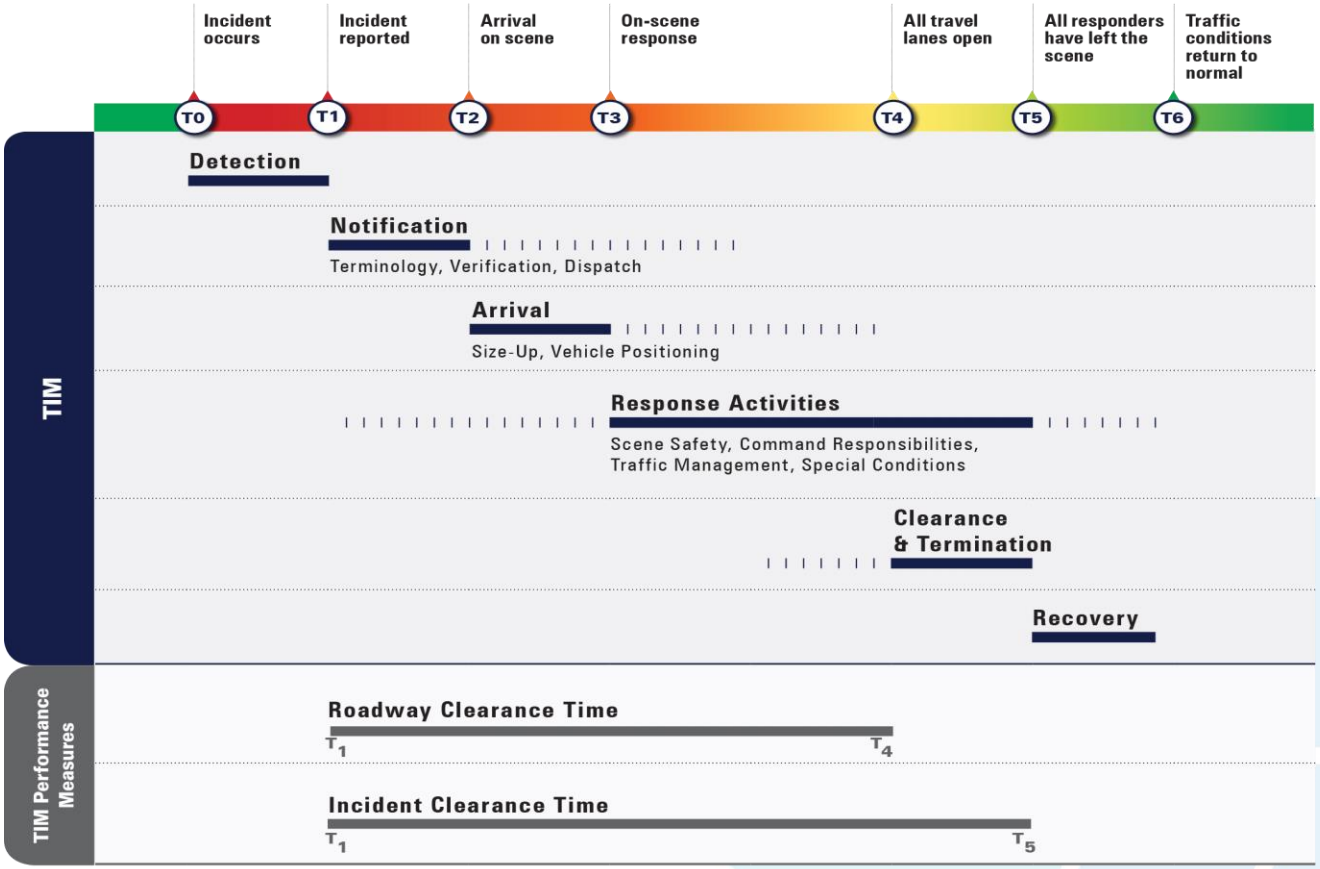
Responder Safety



Safe, Quick Clearance

Prompt, Reliable, Interoperable Communications

Incident Timeline: What Does Safe Quick Clearance Mean?



What is a TIM Program?

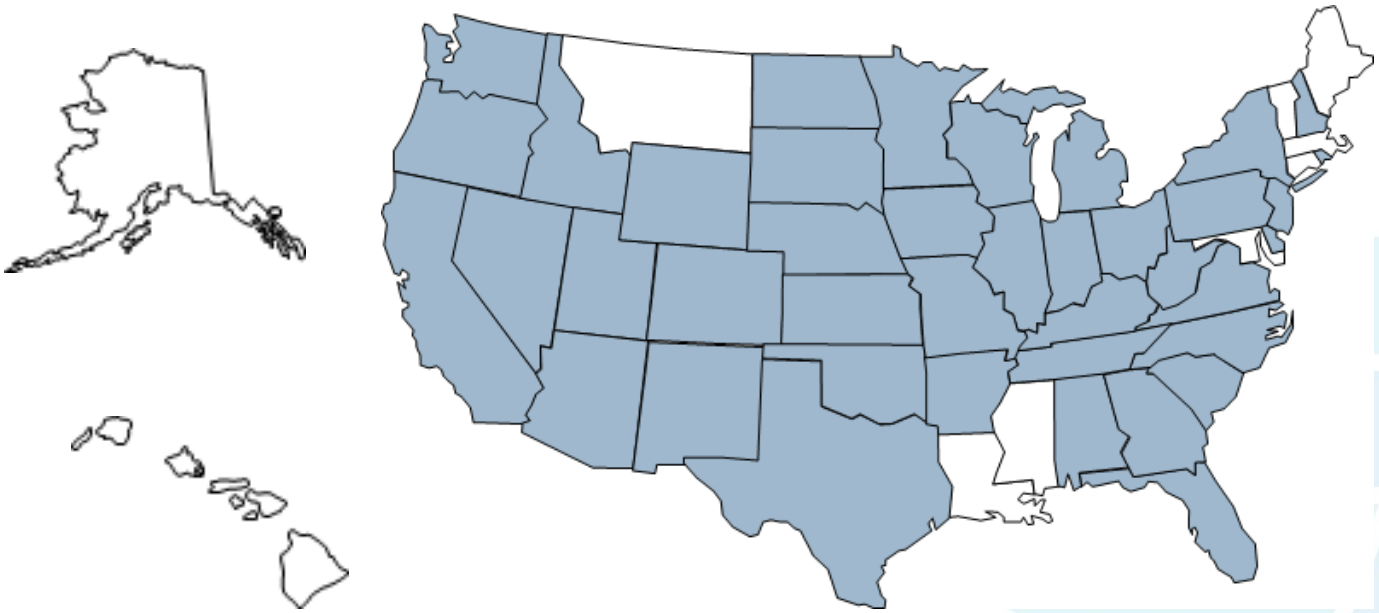
- The goal of a TIM program is to work towards a more effective, efficient response for all responding agencies
- Conscious effort to coordinate and plan to create an effective, comprehensive TIM program
- TIM programs and associated committees and task forces are sustained and ongoing

Discussion Item

- What are your current activities and program for TIM?
- Who if any are identified as dedicated TIM staff?
- What has been a significant challenge to your program? How are you addressing that challenge?
- Who should be included in your TIM discussions?

Authority Removal or "Remove It" Law

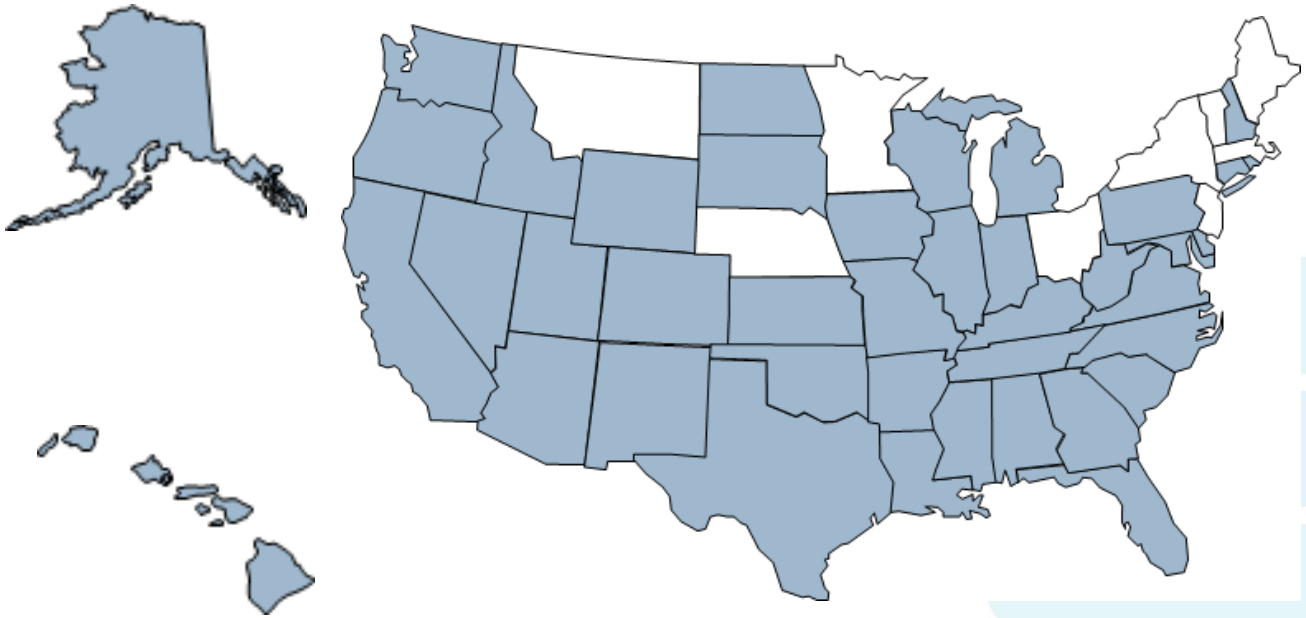
- Remove abandoned vehicles and spilled cargo from the roadway
- Authority and immunity from liability for CHP and anyone they direct



CVC 23113
- Owner
- Caltrans
- 3rd Party

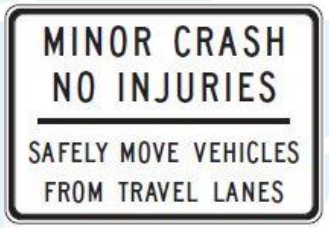
Driver Removal or "Move It" Law

- Minor, non-injury crash
- Vehicles are drivable
- Required to move vehicles from travel lanes



Hit and Run Law

CVC 20002
- Misdemeanor
- 6 mo. County jail
- $1000 fine



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Towing – CVC 21719

- Tow operators can use the center median or right shoulder
  - A peace officer determines the obstruction is causing unnecessary delay.
  - A peace officer gives permission to the tow truck driver.
  - The tow truck is operated at a prudent speed with due regard for weather, visibility, and traffic.
  - The tow truck displays flashing amber warning lamps to the front, rear, and both sides.

Freeway Service Patrol

- Trained personnel using specially equipped vehicles to:
  - patrol congested highways,
  - search for and respond to traffic incidents, and
  - provide motorist assistance
- 2016 San Joaquin Benefits (Berkeley 2017)
  - Benefit-to-Cost 3:1
  - Delay Savings: 89,965 veh-hrs
  - Fuel Savings: 154,649 gal
  - CO_2 Savings: 1,360,912 Kg
- WAZE data?

Freeway Service Patrol For San Joaquin County
A service brought to you by SJCOG, CHP and Caltrans

High-Level TIM Training Framework and Tiered TIM Focus Areas

Tier 1:
Training for Traffic Incident Responders (SHRP2 L12)

Tier 2:
Advanced TIM Workshop (for Mid-Level Managers)

Tier 3:
Executive Level Briefings (for Decision Makers)

Program Focus (Committee/Task Force)

- Relationships
- Needs Assessment
- Training
- Performance Evaluation
- Asset Management
- Contracting
- Administration & Staffing
- *Finance/Budget*

Traffic Incident Management Training

- Multi-disciplinary training with national curriculum
- Develops cadre of emergency responders who work together at an accident scene in a coordinated manner
- Improves safety to responders and travelers
- Developed by responders for responders

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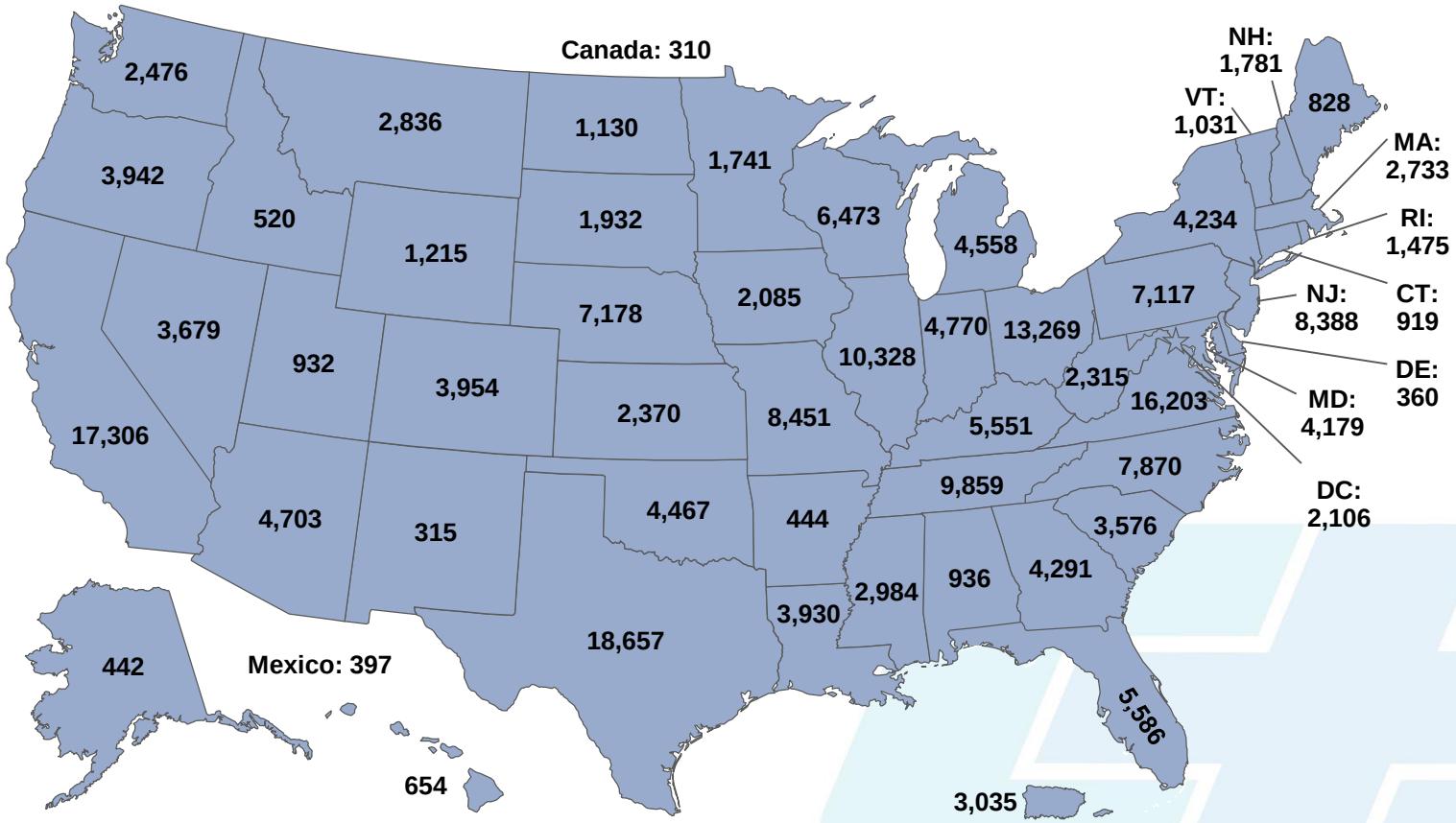
CA SHRP2 TIM Training

- 14 1.5-day “Train-the-Trainer” courses
- 795 4-hour responder courses
- 17,300 total responders trained in CA
  - 460 instructors trained
  - 13,300 responders trained in classes
  - 3,400 responders trained online
  - 200 responders trained with CT video

- Institutionalized:
  - CHP Academy
  - Caltrans Maintenance Academy (NEMO)
  - Towing rotation/FSP
  - EMSA CEUs
  - LEMSA contract requirement

TIM Training Program Implementation Progress
Total Trained = 232,821 (7.4% from CA) as of January 9, 2017



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TIM Training Program

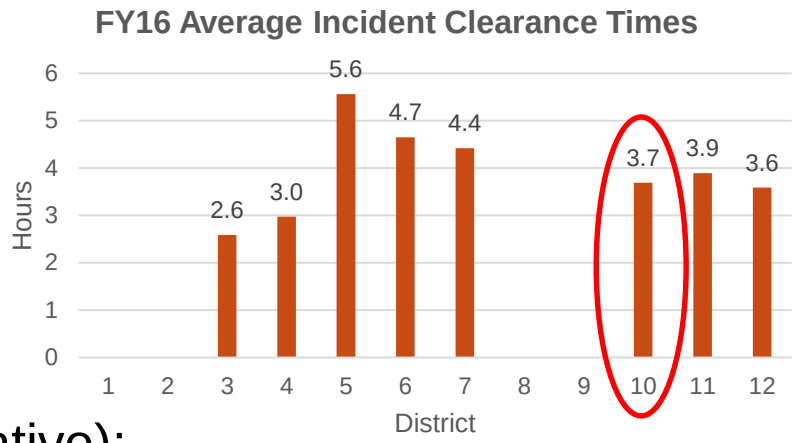
- Who has been involved in the TIM Training in this region?
- Who hasn't, but should, be part of a future training session?
- What other types of TIM training are needed here?

San Joaquin County: 13 classes:**

Law	Fire	Tow	EMS	DOT	Other	Total
118	81	64	4	63**	6	336

**Does not include NEMO Classes

Measuring Success



- **What Gets Measured Gets Performed...**
  - Quantifying TIM benefits will advance program continuity.
  - Every Day Counts 4 (EDC-4 Initiative):

    "Accelerating Traffic Incident Management Data Collection"
    - Increase the volume of data from transportation, law enforcement, and other responder agencies.
    - Promotes use of low-cost, off-the-shelf technologies that streamline data collection.

TIM Performance Measures

- "Roadway" Clearance Time
  - Time from first record of an incident by a responsible agency to all lanes being open to traffic - **MIDB**
- "Incident" Clearance Time
  - Time from first record to time last responder leaves scene
- Secondary Crashes
  - Crashes beginning with the time of detection of the primary incident
    - within the incident scene or
    - within the queue, including the opposite direction

Discussion: Improving Traffic Incident Management

- How to move to the next level?
  - ↳Meet! Know your counterparts!
- How to involve key stakeholders?
  - ↳Show that you can provide a service
- How to sell the program internally?
  - ↳Data, data, data!
- State Transporation Innovation Council (STIC)?

TIM Take Aways

- Develop a TIM “program”
- Include all of the critical stakeholders in TIM activities
- Know the NUG and the NUG framework
- Take advantage of the TIM training
  - Provide time for your instructors to train and for your personnel to attend training
  - Video
  - Online

Emergency Operations

Types of Emergency Events

- Tsunamis/Tornadoes
- Floods
- Heavy rains
- Earthquakes
- Wild Fires
- Winter Weather / Snow and Ice Storms
- Homeland Security / Catastrophic Infrastructure emergencies

GRAPEVINE CLOSED DUE TO SNOW NO ETO

CAL FIRE NEEDS SR 4 SHUT DOWN BOTH DIR

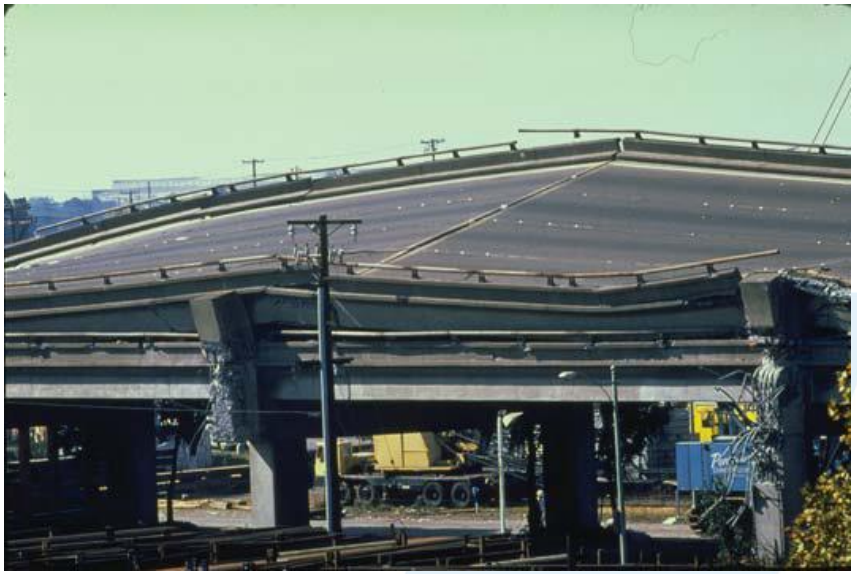
MUD SLIDE NEAR BYPASS

RDWY FLOODING #1 LN

PER CHP - CREATING TRF HAZARD LG DUST CLOUD

Common Characteristics of These Events

- Large scale impact
- Can happen anytime, often without warning
- Transportation is critical to effective response
  - Whether transportation infrastructure is affected or not



Emergency Operations

- What have been some major events to impact the Altamont Corridor?
  - What worked well to respond
  - What were some items that did not work well
  - How have processes changed as a result
- What types of events do agencies usually plan for?

Emergency Operations Goals

- Minimize the impact of disaster on people, property, environment, and the economy.
- Assure mobility of the public and emergency response personnel.
- Assure agency continuity.
- Protect agency facilities and resources.

Emergency Operations Practice Areas

- Interagency Coordination and Communication
- Policy/MOUs
- Emergency Response Planning/Training
- Threats and Vulnerabilities
- Emergency Operations
- Equipment
- Mutual Aid
- Notification, Awareness, and Information Sharing

We will discuss each of these in the following slides

Interagency Coordination and Communication

- Coordination and communication is key during the emergency
  - Public information coordination needs to be included
- Communications interoperability
  - Interagency communications are critical
  - Options include common radio frequencies and mobile phones
- Interagency training is important to coordination and communication

Policy/MOUs

- Protection of vulnerable systems/components
- Critical infrastructure protection
- Cooperation between enforcement and transportation agencies for closing roadways
  - CHP/CT Joint Operational Policy Statements
  - Streets and Highways Code 92 – Caltrans owns infrastructure - Any act necessary
  - CA Vehicle Code 2400 – CHP has primary investigative authority – Incident Commander
  - Natural link to TIM

Emergency Operations Planning

- Define needs by type of emergency event
  - Consider each practice area mentioned earlier
- Define stakeholders, partners, and resources
- Develop Concept of Operations for emergency response
  - Emergency operations center
  - Roles and responsibilities
  - Staffing - especially maintenance & operations needs
  - Relationship of transportation management center

Make Sure Your Plan Includes

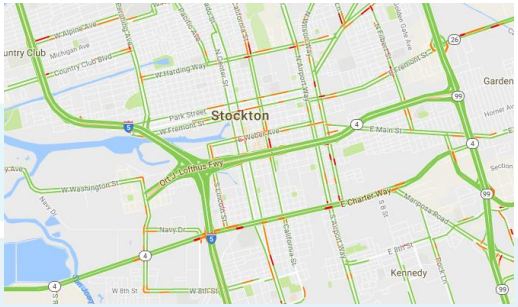
- Availability and staging of resources
  - Keep in mind non-transportation resources
- Operational Strategies, including:
  - Evaluation of alternate routes and shoulder use
  - Contraflow Operations
  - Traffic Signal Operation
  - Suspension of work zones
  - Mobilization of contractors and equipment
- Use of public transportation
- Traveler information

Emergency Response Planning and Vulnerability Assessment

- Vulnerable systems or components can compromise effective emergency response
- Emergency response planning can be a vulnerability mitigation tactic
  - If critical infrastructure fails, emergency response plans can be implemented in response
  - Emergency response planning may identify vulnerable components
- Assessment is key to planning

Vulnerability Assessment

- Identifies system components that may be weak spots in emergency or disaster situations
  - Identify, quantify, prioritize (or rank) the vulnerabilities in a system
- Helps identify critical parts of the system that should be:
  - Improved (made less vulnerable)
  - Protected
  - Monitored



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Maintenance of Emergency Operations Plans

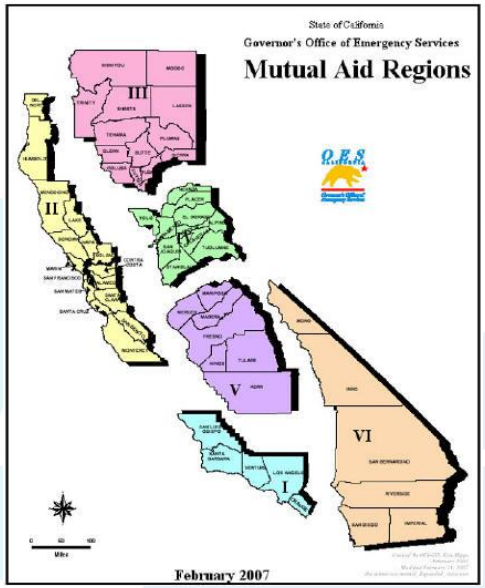
- After event de-briefing
- Routine maintenance and monitoring
- Updating emergency plans, contacts, resources
- Training Exercises
- Human factor – What if?

Equipment

- Equipment inventory management
  - List of resources and their location – GPS, Responder
  - Include TIM, maintenance, ITS resources
- Traffic control equipment / traffic management systems
  - TMC
  - Roadway/weather conditions (e.g. RWIS)
- Telecommunications and power
- Hazardous materials management
- Mapping and information equipment
- Emergency notification equipment

Mutual Aid

- Multi-jurisdictional agreements to provide aid across boundaries and borders
  - Regions IV and V
  - Caltrans Districts (D3, D4, D5, D6, D9)
  - CHP Divisions (Central, Valley, Southern)
  - Counties
  - Nevada
- Participation on tiger teams



Notification, Awareness, and Information Sharing

- Coordination and notification processes
  - Multiple means of notification
  - Media contacts / sharing info with the public
- Information sharing among response agencies
- Role of transportation agencies
  - Maintenance/Operations
  - Traveler information, public outreach, media relations
    - QuickMap, 511, CMS, HAR, Internet, Social Media
    - Emergency Alerts
    - TV, Radio, print media
    - Public information specialists

ETO Considerations

- Looking ahead, what are the priority items that need to be addressed to support response to emergencies?
  - Hint – is it a plan, a policy, training?
- What can agencies start doing today?

Work Zones

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What Are Some Challenges You Experience With Work Zones?

- How do work zones affect operation of the transportation system?

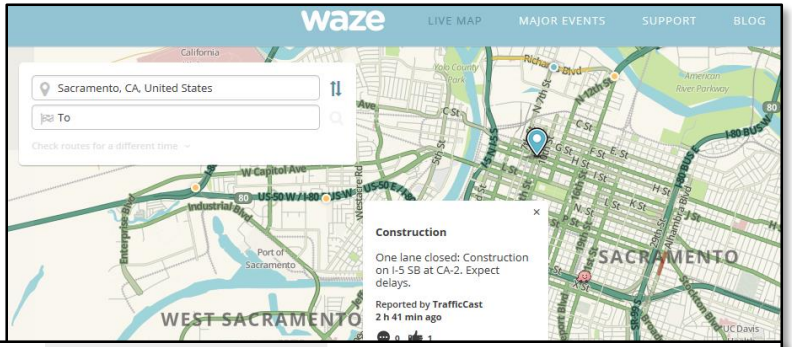
- Integrated Corridors – is there data sharing between partners?

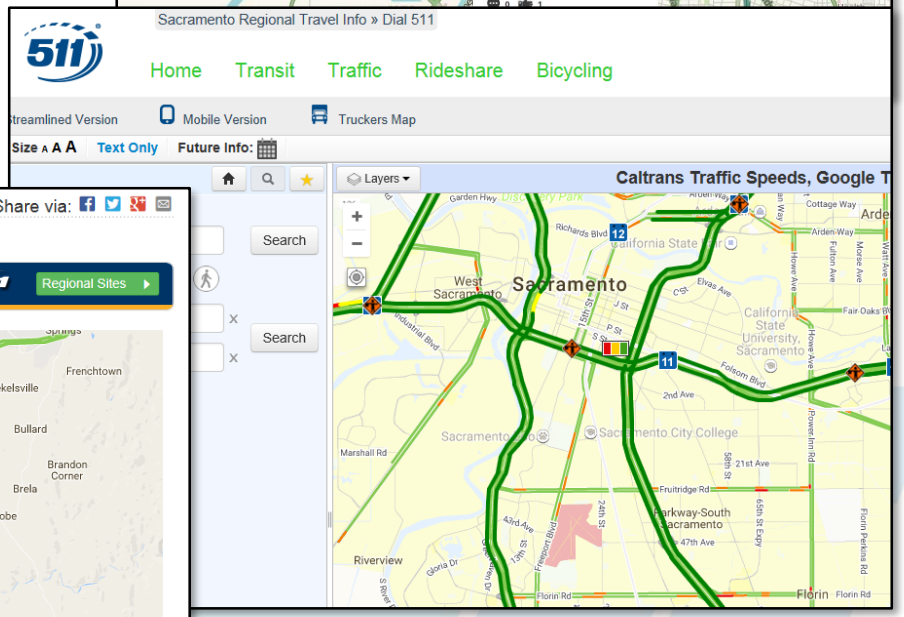
Work Zone Challenges

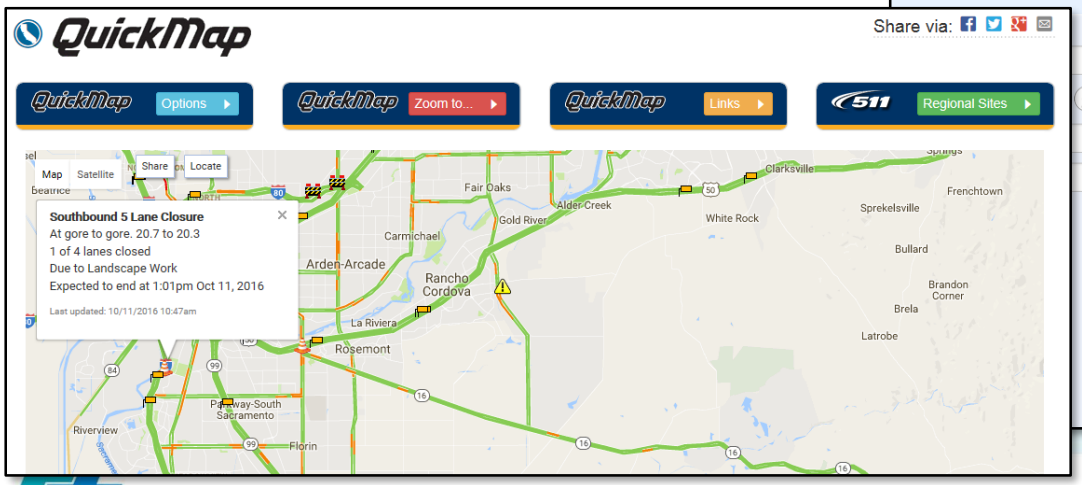
- Worker & road user safety
- Work zone congestion & delay
  - ↳ Construction “FSP”
- Alternate routing & travel route availability
- Day & night conditions/visibility
- Traffic pattern changes
- Incident management
  - ↳ Coordination with responder agencies
- Freight
- **ITS Elements – be involved!**

How Travelers Experience Work Zones

23CFR511







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Tools: WZ Management Strategies

- Traffic control
- Contract incentives
- Accelerated construction
- Off-peak/night work
- Narrowed lanes
- Ramp closures
- Contraflow lanes
- Enhanced enforcement
- Freeway service patrol
- Demand management
- Traveler information
- ITS
- Signal timing adjustments
- ...and many more

TMP Development in Caltrans

Begins during project initiation and planning

- Responsibility of 3 individuals
  - District traffic manager (DTM)
  - TMP manager
  - Construction traffic manager
- 3 levels - factors
  - Project characteristics
  - Projected delay

LEVEL OF TMP	TYPES OF CONDITIONS	TYPES OF STRATEGIES
"Blanket" TMP	• No expected delays • Off-peak work • Low volume roads • Moving lane closures	• Portable changeable message sign (CMS) • Freeway service patrol (FSP) • Traffic management team (TMT) • Only working in off-peak hours
"Minor" TMP (Majority of TMPs fall into this category)	• Minimal impacts expected • Lane closure required for project • Some mitigation measures required for project	• Only working at night • Portable and fixed CMS • Construction Zone Enhanced Enforcement Program (COZEEP) or MAZEEP for maintenance activities • TMT • Highway advisory radio
"Major" TMP (~5% of TMPs are major)	• Significant impacts expected • Multi-jurisdictional in scope • Longer duration • Multiple contracts involved	Same as for Minor TMPs plus: • Public awareness campaigns • Extended closures to expedite work • Moveable barriers to reverse lanes during peak periods • Detours • Reduced lane widths • Website

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